

VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a Major, Municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards (WQS) of 9 VAC 25-260. The discharge results from the operation of municipal sewage treatment plant. This permit action consists of reissuing an existing permit to discharge treated municipal wastewater with revisions to the permit, as needed, due to changes in applicable laws, guidance, and available technical information.

1. Facility Name and Address:
Middle River Regional STP
PO Box 859
Verona, VA 24482
Location: 828 Laurel Hill Rd, Verona
SIC Code: 4952 - Sewerage Systems

2. Permit No. VA0064793
Expiration Date: February 28, 2011

3. Owner Contact: Name: Kenneth J. Fanfoni
Title: Executive Director
Telephone No: 540-245-5670

4. Application Complete Date: August 27, 2010

Permit Drafted By: Kate B. Harrigan
Reviewed By: Dawn Jeffries *Dawn Jeffries* Date: October 21, 2010
Date: 10-28-10

Public Comment Period: Dec 18 2010 to Jan 17, 2011

5. Receiving Stream Name: Middle River
Basin: Potomac
Section: 4
Special Standards: pH
Impaired? Yes
Watershed Name: VAN-B12R Middle River/Lewis Creek
River Mile: 26.95
Subbasin: Shenandoah
Class: IV
Tidal Waters? No

6. Operator License Requirements per 9 VAC 25-31-200.C: I

7. Reliability Class per 9 VAC 25-790: II (Assigned September 17, 1974)

8. Permit Characterization:

☐ Private ☐ Federal ☐ State ☒ POTW ☐ PVOTW
☐ Possible Interstate Effect ☐ Interim Limits in Other Document (attach copy of CSO)

9. Description of Treatment Works Treating Domestic Sewage:

Appendix A

Total Number of Outfalls = 1

Operation and Maintenance (O&M) Manual: Approved April 26, 2002

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10. Discharge Location Description and Receiving Waters Information:

Appendix B

11. Antidegradation Review & Comments per 9 VAC 25-260-30: Tier: 1

The State Water Control Board's Water Quality Standards (WQS) includes an antidegradation policy. All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the WQS. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with a Tier determination. Middle River is determined to be a Tier 1 waterbody. This determination is based on the fact that WQS for Ammonia-N were not maintained in Middle River some distance downstream of the current discharge point from sometime in the early 1970s when Staunton STP was built and began discharging until on or about November 12, 1995, when Middle River Regional STP discharge commenced. Furthermore, in previous permits, the effluent limits for Ammonia-N were set to give both Staunton STP and Middle River Regional STP the full waste load allocation (WLA) for Ammonia-N in Middle River.

12. Site Inspection: Performed by: Noel Thomas

Date: September 13, 2010

13. Effluent Screening and Effluent Limitations:

Appendix C

14. Effluent toxicity testing requirements included per 9 VAC 25-31-220.D: ☒ Yes ☐ No

Appendix D

If "No," check one:

- ☐ Municipal: This facility does not have a design flow \geq 1.0 MGD, has no Significant Industrial Users (SIUs) or Categorical Industrial Users (CIUs), and is not deemed to have the potential to cause or contribute to instream toxicity.
- ☐ Industrial: This facility's SIC Code(s) and activities contributing wastewater do not fall within the categories for which aquatic toxicity monitoring is required, the facility does not have an IWC \geq 33%, and the discharge is not deemed to have the potential to cause or contribute to instream toxicity.

15. Management of Sewage Sludge:

Sludge from this facility is either land applied by Houff's Feed and Fertilizer Company under VPA Permit No. VPA01566, VPA01580, or VPA01581 or disposed of in the Augusta County Regional Landfill.

The relevant sludge condition has been included in the permit.

16. Permit Changes and Bases for Special Conditions:

Appendix E

17. Material Storage per 9 VAC 25-31-280.B.2: This permit requires that the facility's O&M Manual include information to address the management of wastes, fluids, and pollutants which may be present at the facility, to avoid unauthorized discharge of such materials.

18. Antibacksliding Review per 9 VAC 25-31-220.L: The Ammonia-N limits are less stringent at this reissuance. See Appendix C for the evaluation that demonstrates why it was determined that less stringent limits were acceptable. This permit complies with Antibacksliding provisions of the VPDES Permit Regulation.

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19. Impaired Use Status Evaluation per 9 VAC 25-31-220.D: Middle River in the immediate vicinity of the discharge is listed in the Middle River TMDL for bacteria which was approved August 10, 2004. The facility was assigned an E. coli WLA of 1.18×10^{13} cfu/year which is based on a design flow of 6.8 MGD and a concentration of 126 N/100mL.
20. Regulation of Users per 9 VAC 25-31-280.B.9: N/A – This facility is owned by a municipality.
21. Storm Water Management per 9 VAC 25-31-120: Application Required? ☒ Yes ☐ No
- Because the Middle River Regional STP has a design flow > 1.0 MGD and has an approved pretreatment program, a storm water application is required. An updated No Exposure; Certification (NEC) for Exclusion from VPDES Storm Water Permitting was submitted on August 30, 2010. The NEC was sent to DEQ inspectors for review and concurrence on September 17, 2010. The NEC will be approved with the reissuance of this permit. No storm water requirements have been included in the permit.
22. Compliance Schedules per 9 VAC 25-31-250: None required by this permit.
23. Variances/Alternative Limits or Conditions per 9 VAC 25-31-280.B, 100.J, 100.P, and 100.M: The permittee has requested waivers from sampling and reporting Fecal Coliform and Form 2A, Part D Expanded Testing Data as part of the application. The waiver requests have been approved based on the justification provided by the permittee and the fact that EPA did not comment on the waiver requests.
24. Financial Assurance Evaluation per 9 VAC 25-650-10: N/A – This facility is owned by a municipality.
25. Nutrient Trading Regulation per 9 VAC 25-820:
Watershed General Permit (WGP) Required: ☒ Yes ☐ No
If Yes: Permit No.: VAN010092
Date General Permit Effective: January 1, 2007
The load limit for Total Nitrogen (TN) is 82,839 pounds per calendar year and Total Phosphorus (TP) is 6,213 pounds per calendar year. These mass or load limits are established in 9 VAC 25-720-70.C based on the design flow as of July 1, 2005 (6.8 MGD).
26. Threatened and Endangered (T&E) Species Screening per 9 VAC 25-260-20 B.8: Because this is not an issuance or reissuance that allows increased discharge flows, and because DGIF or DCR did not ask specifically to review the application, T&E screening is not required.
27. Virginia Environmental Excellence Program (VEEP) Evaluation per § 10.1-1187.1-7:
Is this facility considered by DEQ to be a participant in the Virginia Environmental Excellence Program in good standing at either the Exemplary Environmental Enterprise (E3) level or the Extraordinary Environmental Enterprise (E4) level?
☒ Yes ☐ No

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28. Public Notice Information per 9 VAC 25-31-290: All pertinent information is on file, and may be inspected and copied by contacting Kate B. Harrigan at: DEQ-Valley Regional Office, P.O. Box 3000, Harrisonburg, Virginia 22801, Telephone No. (540) 574-7850, kathleen.harrigan@deq.virginia.gov.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

29. Historical Record

Staunton STP began discharging in the early 1970s. Staunton STP was covered under VPDES No. VA0064793. The permit was reissued on November 12, 1991, at a design flow of 4.5 MGD for Staunton STP. This permit was revoked and reissued on March 24, 1994, with an interim design flow of 4.5 MGD for Staunton STP and final design flow of 4.5 MGD and 5.3 MGD for the new Middle River Regional STP. In 1995, the Middle River Regional STP was built to upgrade and replace Staunton STP. At the final design flow of 5.3 MGD, the existing Verona STP (0.8 MGD) and the newly constructed Middle River Regional STP (4.5 MGD) were authorized to function as one regional facility and operate through one permitted outfall. This outfall was the same outfall that was previously used by Staunton STP. A CTO was issued for the Middle River Regional STP on April 9, 1996. The design flow was increased to 6.8 MGD at the permit reissuance on March 24, 1999. A CTO was issued for the STP expansion/upgrade to a design flow of 6.8 MGD on November 2, 2001. The design flow of the facility has not increased since that time.

APPENDIX A

DESCRIPTION OF TREATMENT WORKS TREATING DOMESTIC SEWAGE

Description of Wastewater Treatment System

Wastewater enters the Middle River Regional STP through two separate collection systems; one serving the Verona portion of Augusta County; one serving the City of Staunton. The Middle River Regional STP treatment train consists of the following units: screening, influent pump station, grit removal, secondary treatment (ENR Process), secondary clarifiers, final clarifiers, filter complex, UV disinfection, cascade aeration, and effluent flow measurement.

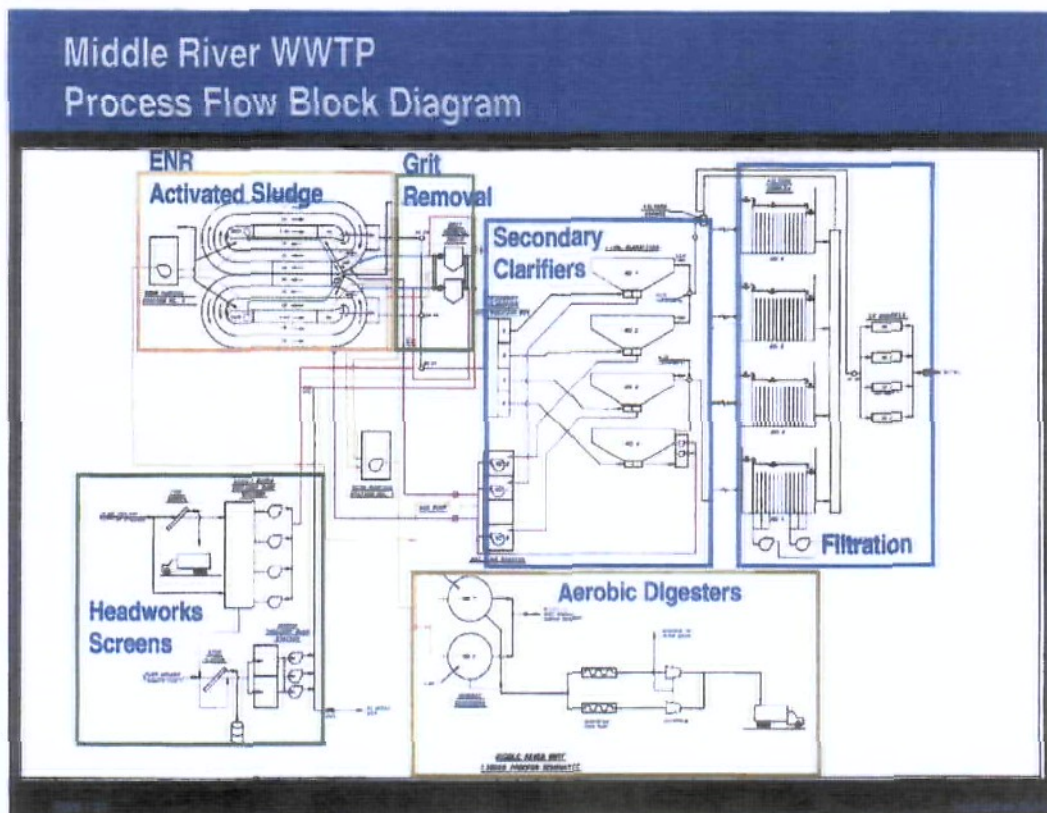
The following units are available for the handling of sludge: aerobic digesters, pre-thickened holding tanks, belt thickener/filter press, and thickened holding tanks.

Flow:

Design Average Flow = 6.8 MGD

Monthly average flow (January 2009 – December 2009) = 3.1 MGD

Flow Schematic



APPENDIX B

DISCHARGE LOCATION DESCRIPTION AND RECEIVING WATERS INFORMATION

This facility discharges to the Middle River in Augusta County. The locations of the STP and Outfall 001 are shown on the topographic map below.

Relevant points of interest within the watershed and in the vicinity of the discharge are shown on the enclosed Water Quality Assessment TMDL Review and corresponding map.

Critical flows in the receiving stream at the discharge point are described in a Flow Frequency Determination that is presented on page 4 of this appendix.

Mixing zone predictions were performed using information specific to the discharge and receiving stream characteristics with the Agency's Virginia DEQ Mixing Zone Analysis Version 2.1 program. Wet season and annual average conditions were examined, and the results are presented on page 5 of this appendix.



Fact Sheet – VPDES Permit No. VA0064793 – Middle River Regional STP

WATER QUALITY ASSESSMENTS REVIEW POTOMAC-SHENANDOAH RIVER BASIN 9/9/2010

IMPAIRED SEGMENTS

SEGMENT ID	STREAM	SEGMENT START	SEGMENT END	SEGMENT LENGTH	PARAMETER
B12R-01-BAC	Lewis Creek	9.54	0.00	9.54	E-coli
B12R-01-BEN	Lewis Creek	9.54	0.00	9.54	Benthic
B12R-01-PCB	Lewis Creek	9.54	0.00	9.54	PCB in Fish Tissue
B14R-01-BAC	Christians Creek	31.56	0.00	31.56	E-coli, Fecal Coliform
B14R-01-BEN	Christians Creek	31.56	0.00	31.56	Benthic
B14R-03-BAC	Long Meadow Run	10.06	0.00	10.06	E-coli
B14R-03-TEMP	Long Meadow Run	10.06	0.00	10.06	Temperature
B15R-01-BAC	Middle River	43.06	0.00	43.06	Fecal Coliform, E-coli
B15R-02-BAC	Polecat Draft	7.42	0.00	7.42	Fecal Coliform

PERMITS

PERMIT	FACILITY	STREAM	RIVER MILE	LAT	LONG	WBID
VA0064793	Middle River Regional STP	Middle River	26.95	381119	0785821	VAV-B12R
VA0002194	American Safety Razor	Middle River X Trib	0.37	381129	0785904	VAV-B12R
VA0022322	Mt. Sidney STP	Middle River X Trib	2.48	381452	0785734	VAV-B15R
VA0025291	ACSA-Fishersville STP	Christians Creek	12.36	380741	0785946	VAV-B14R
VA0062481	New Hope STP	Middle River	12.55	381305	0785425	VAV-B15R
VA0088170	Verona WTP	Falling Spring Run	1.62	381228	0790207	VAV-B12R
	Woodlawn Village Mobile					
VA0089061	Home Park	Meadow Run X-Trib	0.52	380853	0785506	VAV-B14R
VA0002194	American Safety Razor_002	Middle River	27.84	381138	0785905	VAV-B12R

MONITORING STATIONS

STREAM	NAME	RIVER MILE	RECORD	LAT	LONG
Middle River	1BMDL036.08	36.08	05/17/79	381437	0790208
Christians Creek	1BCST007.42	7.42	7/2003	380926	0785819
Christians Creek	1BCST012.32	12.32	05/17/79	380743	0785941
Lewis Creek	1BLEW002.91	2.91	07/07/68	380958	0790014
Middle River	1BMDL022.09	22.09	9/23/99	381234	0785844
Middle River	1BMDL029.46	29.46	9/23/99	381228	0790009
Polecat Draft	1BPCD001.03	1.03	07/01/93	381309	0785231
Middle River X-Trib	1BXBF002.75	2.75	7/1/99	381452	0785749
Christians Creek	1BCST000.13	0.13	7/2003	381132	0785606
Meadow Run	1BMDW000.18	0.18	7/2003	381128	0785557
LEWIS CREEK	1BLEW006.93	6.93	7/2001	3894.8	0793330
Middle River	1BMDL029.70	29.7	7/2001	381240	0790180
Middle River	1BMDL009.23	9.23	7/2001	381355	0785352
Lewis Creek	1BLEW006.95	6.95	1984	380903	0790338
Middle River	1BMDL026.58	26.58	2/15/02	381133	0785819
Lewis Creek	1BLEW000.61	0.61	1984	381058	0785832

PUBLIC WATER SUPPLY INTAKES

OWNER	STREAM	RIVER MILE
None		

WATER QUALITY MANAGEMENT PLANNING REGULATION

Is this discharge addressed in the WQMP regulation? **Yes**

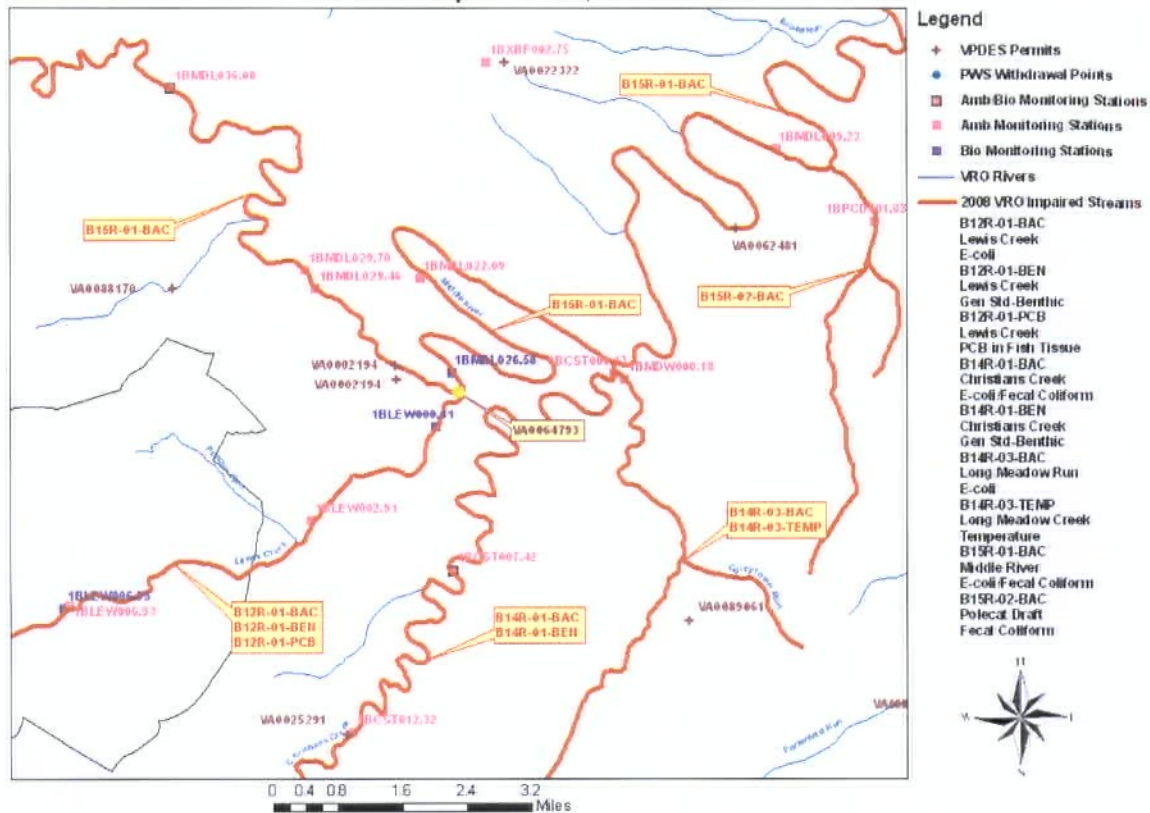
If Yes, what effluent limitations or restrictions does the WQMP regulation impose on this discharge?

PARAMETER	ALLOCATION
Nutrients under the Watershed General Permit	

WATERSHED NAME

VAV-B12R Middle River/Lewis Creek

Middle River Regional STP - Water Quality Assessments Review
Potomac-Shenandoah River Basin
September 9, 2010



Fact Sheet – VPDES Permit No. VA0064793 – Middle River Regional STP

MEMORANDUM
DEPARTMENT OF ENVIRONMENTAL QUALITY
VALLEY REGIONAL OFFICE

4411 Early Road – P.O. Box 3000

Harrisonburg, VA 22801

SUBJECT: Flow Frequency Determination
Middle River Regional STP – VPDES Permit No. VA0064793, Augusta County

TO: Permit Processing File

FROM: Keith Showman

DATE: October 6, 2010

This memo supersedes Larry Hough's flow frequency determination dated October 8, 2003. The subject facility discharges to Middle River near Verona, VA. Stream flow frequencies are required at this site for use by the permit writer in developing effluent limitations for the VPDES permit reissuance.

Flow frequencies prior to 2003 had been based on the Middle River near Verona, VA gage (#01624300). However the gage, with a 19-year period of record, was damaged by flooding in 1986, and had not been returned to continuous service at the time of the 2003 flow frequency determination. The VDEQ operated gage has since been returned to continuous service and has a period of record from 1967-86 and 2002 – present. This gage is located at the US Route 742 bridge and is approximately 9 miles upstream of the discharge point. The flow frequencies for the discharge point were determined using a drainage area comparison. The flow frequencies are presented below:

Middle River near Verona, VA (#01624300):

Drainage Area = 179 mi²

1Q30 = NA	High Flow 1Q10 = 35 cfs
1Q10 = 27 cfs	High Flow 7Q10 = 36 cfs
7Q10 = 29 cfs	High Flow 30Q10 = 42 cfs
30Q10 = 32 cfs	HM = 88 cfs
30Q5 = 36 cfs	

Middle River at discharge point:

Drainage Area = 200.4 mi²

1Q30 = NA	High Flow 1Q10 = 39.2 cfs	(25.3 mgd)	
1Q10 = 30.2 cfs	(19.5 mgd)	High Flow 7Q10 = 40.3 cfs	(26.0 mgd)
7Q10 = 32.5 cfs	(21.0 mgd)	High Flow 30Q10 = 47.0 cfs	(30.4 mgd)
30Q10 = 35.8 cfs	(23.1 mgd)	HM = 98.5 cfs	(63.7 mgd)
30Q5 = 40.3 cfs	(26.0 mgd)		

The analysis does not address any other withdrawals, discharges, or springs lying between the gage and the outfall.

The high flow months are November through May.

REVIEWER: ERM

DATE: 10/7/10

Mixing Zone Predictions (Virginia DEQ Mixing Zone Analysis Version 2.1)

Annual

Effluent Flow = 6.8 MGD
Stream 7Q10 = 21.0 MGD
Stream 30Q10 = 23.1 MGD
Stream 1Q10 = 19.5 MGD
Stream slope = 0.0011 ft/ft
Stream width = 53 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 1.1993 ft
Length = 3077.41 ft
Velocity = .677 ft/sec
Residence Time = .0526 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 1.2539 ft
Length = 2961.54 ft
Velocity = .6965 ft/sec
Residence Time = .0492 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 1.1594 ft
Length = 3168.67 ft
Velocity = .6625 ft/sec
Residence Time = 1.3285 hours

Recommendation: A complete mix assumption is appropriate for this situation providing no more than 75.27% of the 1Q10 is used.

Wet Season

Effluent Flow = 6.8 MGD
Stream 7Q10 = 26.0 MGD
Stream 30Q10 = 30.4 MGD
Stream 1Q10 = 25.3 MGD
Stream slope = 0.0011 ft/ft
Stream width = 53 ft
Bottom scale = 2
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 1.3269 ft
Length = 2820.23 ft
Velocity = .722 ft/sec
Residence Time = .0452 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 1.4331 ft
Length = 2638.08 ft
Velocity = .7581 ft/sec
Residence Time = .0403 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 1.3095 ft
Length = 2852.55 ft
Velocity = .716 ft/sec
Residence Time = 1.1067 hours

Recommendation: A complete mix assumption is appropriate for this situation providing no more than 90.36% of the 1Q10 is used.

APPENDIX C

EFFLUENT SCREENING AND EFFLUENT LIMITATIONS

Effluent Limitations

A comparison of technology and water quality-based limits was performed, and the most stringent limits were selected. The selected limits are summarized in the table below.

Outfall 001

Final Limits

Design Flow: 6.8 MGD

PARAMETER	BASIS FOR LIMITS	EFFLUENT LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average		Maximum		Frequency	Sample Type
Flow (MGD)	1	NL		NL		Continuous	TIRE
-----	-----	Monthly Average		Weekly Average		-----	-----
BOD ₅	2,3,4	30 mg/L	770 kg/d	45 mg/L	1200 kg/d	1/Week	24 HC
TSS	2	30 mg/L	770 kg/d	45 mg/L	1200 kg/d	1/Month	24 HC
Ammonia-N (Jun-Oct)	3	5.8 mg/L		7.1 mg/L		1/Week	24 HC
Ammonia-N (Nov-May)	3	9.9 mg/L		12 mg/L		1/Week	24 HC
Effluent Chlorine (TRC)*	3	0.026 mg/L		0.028 mg/L		12/Day	Grab
E. coli* (geometric mean)	3,8	126 N/100 mL		NA		2/Month (10 am to 4 pm)	Grab
E. coli** (geometric mean)	3,8	126 N/100 mL		NA		3 /Week every other day (10 am to 4 pm)	Grab
-----	-----	Yearly Average		Maximum		-----	-----
TP – Year to Date	6	NL (mg/L)		NA		1/Month	Calculated
TP – Calendar Year	6,7	0.30 mg/L		NA		1/Year	Calculated
TN – Year to Date	6	NL (mg/L)		NA		1/Month	Calculated
TN – Calendar Year	6,7	4.0 mg/L		NA		1/Year	Calculated
-----	-----	Minimum		Maximum		-----	-----
pH	3	6.5 S.U.		9.5 S.U.		1/Day	Grab
Contact Chlorine (TRC)*	3,5	1.0 mg/L		NA		1/2 Hr	Grab

NL = No Limitation, monitoring required

TIRE = Totalizing, Indicating, and Recording equipment

NA = Not Applicable

24 HC = 24 Hour composite sample

* = Applicable only when chlorination is used for disinfection.

** = Applicable if an alternative to chlorination is used for disinfection.

Bases for Effluent Limitations:

1. VPDES Permit Regulation (9 VAC 25-31)
2. Federal Effluent Requirements (Secondary Treatment Regulation - 40CFR133)
3. Water Quality Standards (9 VAC 25-260)
4. Regional Stream Model simulation
5. Best Professional Judgment (BPJ)
6. Guidance Memo No. 07-2008, Amendment No. 2, 10/23/07, Permitting Considerations for Facilities in the Chesapeake Bay Watershed
7. Annual average concentration limits are based on the Technology Regulation (9 VAC 25-40-70)
8. Middle River Bacteria TMDL

Limiting Factors – Overview:

The following potential limiting factors have been considered in developing this permit and fact sheet:

Water Quality Management Plan Regulation (9 VAC 25-720-60 Potomac-Shenandoah River Basin)	
A. TMDL limits	E. coli
B. Non-TMDL WLAs	None
C. CBP (TN & TP) WLAs	TN and TP by coverage under VAN010092
Federal Effluent Guidelines	BOD ₅ , TSS, pH
BPJ/Agency Guidance limits	TRC (contact), Ammonia-N
Water Quality-based Limits - numeric	BOD ₅ , DO, Ammonia-N, TRC (effluent), E. coli, pH
Water Quality-based Limits - narrative	None
Toxics Management Plan (TMP)	See Appendix D
Storm Water Limits	Not applicable

EVALUATION OF THE EFFLUENT – CONVENTIONAL POLLUTANTS

The model developed at the previous reissuance has been reviewed and has been determined to still be protective. The model includes the following:

cBOD ₅	=	25 mg/L
TKN	=	8.7 mg/L
DO	=	0 mg/L

Because a cBOD₅ concentration of 25 mg/L is equivalent to a BOD₅ concentration of 30 mg/L, the cBOD₅ limit of 25 mg/L that was included in the previous permit has been replaced with a BOD₅ limit of 30 mg/L at this reissuance.

Because the model demonstrated that an effluent DO of 0 mg/L was protective, this permit does not include a DO limit.

Based on the previous model, a TKN value of 8.7 mg/L was protective. It was determined that no TKN limits were needed because the Ammonia-N limits imposed in the permit will control TKN.

The TSS limits are consistent with the Secondary Treatment Regulation and have been carried forward from the previous permit.

The pH limits reflect the current WQS for pH in the receiving stream and have been carried forward from the previous permit.

An evaluation of the facility's records for the previous 3 years indicates that the effluent cBOD₅ concentration is averaging less than 5% of the monthly average limit; therefore, a reduction in monitoring frequency for BOD₅ is warranted – from a frequency of 1/Day to a frequency of 1/Week.

EVALUATION OF THE EFFLUENT – DISINFECTION

If chlorination is used for disinfection, the permit requires 2/Month E. coli monitoring to demonstrate compliance with the monthly geometric mean limit. If an alternative to chlorination is utilized for disinfection, E. coli monitoring is required 3 Days/Week. The E. coli limit reflects current WQC requirements for E. coli in Middle River and the facility's E. coli TMDL WLA and has been carried forward from the previous permit.

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EVALUATION OF THE EFFLUENT – NUTRIENTS

In accordance with § 62.1-44.19:14.C.5. of the Code of Virginia, this Significant Discharger has submitted a Registration Statement and DEQ has recognized that they are covered under the General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia (9 VAC 25-820-10 *et seq.*). The effective date of coverage is January 1, 2007. Coverage under the General Permit will expire December 31, 2011.

The load limit for TN is 82,839 pounds per calendar year and TP is 6,213 pounds per calendar year. These mass or load limits are established in 9 VAC 25-720-70.C based on the design flow as of July 1, 2005 (6.8 MGD).

The Augusta County Service Authority has indicated that Middle River Regional STP will be “bubbled” with their other facilities. Annual average concentration limits of TN = 4.0 mg/L and TP = 0.30 mg/L have been included per the requirements of 9 VAC 25-40-70.A.

EVALUATION OF THE EFFLUENT – TOXIC POLLUTANTS

Input parameters for instream water quality criteria (WQC) and WLAs

Stream: Water quality data for the receiving stream was obtained from Ambient Monitoring Station No. 1BMDL036.08 on the Middle River at the Rte 742 Bridge. Toxic substances, including Ammonia-N and TRC, are assumed absent in the receiving stream because there are no data to indicate their presence.

Stream Parameter	Value	Units
Mean Hardness (as CaCO ₃) =	163	mg/L
90 th Percentile Temperature (Annual) =	22.2	°C
90 th Percentile Temperature (Wet season*) =	15.1	°C
90 th Percentile Maximum pH =	8.8	SU
10 th Percentile Maximum pH =	7.6	SU

Effluent: The pH and temperature values were obtained from the daily operational data submitted by the permittee. The hardness value was carried forward from the previous reissuance.

Effluent Parameter	Value	Units
Mean Hardness (as CaCO ₃) =	192	mg/L
90 th Percentile Temperature (Annual) =	23	°C
90 th Percentile Temperature (Wet season*) =	18	°C
90 th Percentile Maximum pH =	7.5	SU
10 th Percentile Maximum pH =	7.0	SU

* Wet Season = November through May

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WQC and WLAs were calculated for the WQS parameters for which data are available. Those WQC and WLAs are presented in this appendix. Current agency guidelines recommends the evaluation of toxic pollutant limits for TRC and Ammonia-N based on default effluent concentrations of 20 mg/L and 9 mg/L, respectively. The effluent data were analyzed per the protocol for evaluation of effluent toxic pollutants included in this appendix with the following results:

- **TRC:** More stringent TRC limits were determined to be necessary at this reissuance based on the monitoring frequency which was changed to 12/Day in accordance with current guidance. Because the facility currently utilizes UV disinfection, a compliance schedule for meeting the more stringent limits has not been included.
- **Ammonia-N:** Less stringent Ammonia-N limits were determined to be necessary at this reissuance. The less stringent limits meet antibacksliding requirements because new stream flow information was available at this reissuance. An evaluation of the facility's records for the previous 3 years indicates that the effluent Ammonia-N concentration is averaging less than 5% of the monthly average limit. In addition, the facility has been designed to achieve an annual average TN concentration limit of 4.0 mg/L. For these reasons, the monitoring frequency for Ammonia-N has been reduced from 1/Day to 1/Week.
- **Additional monitoring data is needed for a number of pollutants due to the lack of effluent quality data.** The permittee must monitor the effluent at outfall 001 for the substances noted in Attachment A of the permit once after the start of the third year from the permit's effective date.

WATER QUALITY CRITERIA / WASTE LOAD ALLOCATION ANALYSIS

Facility Name:		Middle River Regional STP		Permit No.: VA0064793		Version: OWP Guidance Memo 00-2011 (8/24/00)	
Receiving Stream:		Middle River Regional STP		Date: 11/3/2010			
Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	163 mg/L	1Q10 (Annual) =	19.5 MGD	Annual	- 1Q10 Flow = 75.27 %	Mean Hardness (as CaCO3) =	192
90% Temperature (Annual) =	22.2 deg C	7Q10 (Annual) =	21 MGD		- 7Q10 Flow = 100 %	90% Temp (Annual) =	23
90% Temperature (Wet season) =	15.1 deg C	30Q10 (Annual) =	23.1 MGD		- 30Q10 Flow = 100 %	90% Temp (Wet season) =	18
90% Maximum pH =	8.8 SU	1Q10 (Wet season) =	25.3 MGD	Wet Season	- 1Q10 Flow = 90.36 %	90% Maximum pH =	7.5
10% Maximum pH =	7.6 SU	30Q10 (Wet season) =	30.4 MGD		- 30Q10 Flow = 100 %	10% Maximum pH =	7.8
Tier Designation =	1	30Q5 =	26 MGD			Current Discharge Flow =	6.800
Public Water Supply (PWS) Y/N? =	N	Harmonic Mean =	63.7 MGD			Discharge Flow for Limit Analysis =	6.800
V(alley) or P(iedmont)? =	V						
Trout Present Y/N? =	N						
Early Life Stages Present Y/N? =	Y						

Footnotes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise.
- All flow values are expressed as Million Gallons per Day (MGD).
- Discharge volumes are highest monthly average or 20 maximum for industries and design flows for Municipal.
- Hardness expressed as mg/l CaCO₃. Standards calculated using Hardness values in the range of 25-400 mg/l CaCO₃.
- "Public Water Supply" protects for fish & water consumption. "Other Surface Waters" protects for fish consumption only.
- Carcinogen "Y" indicates carcinogenic parameter.
- Ammonia WQS selected from separate tables, based on pH and temperature.
- Metals measured as Dissolved, unless specified otherwise.
- WLA = Waste Load Allocation (based on standards).
- WLA = Waste Load Allocation (based on standards).
- WLAs are based on mass balances (less background, if data exist).
- Acute - 1 hour avg. concentration not to be exceeded more than 1/3 years.
- Chronic - 4 day avg. concentration (30 day avg. for Ammonia) not to be exceeded more than 1/3 years.
- Mass balances employ 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens, and Harmonic Mean for Carcinogens. Actual flows employed are a function of the mixing analysis and may be less than the actual.
- Effluent Limitations are calculated elsewhere using the minimum WLA and EPA's statistical approach (Technical Support Document).

Facility Name: Middle River Regional STP		Permit No.: VA0064793		WATER QUALITY CRITERIA				NON-ANTIDEGRADATION WASTE LOAD ALLOCATIONS			
Receiving Stream: Middle River Regional STP		Date: 10/18/2010		6.800 MGD Discharge Flow - Mix per "Mixer"				6.800 MGD Discharge - Mix per "Mixer"			
				Aquatic Protection		Human Health		Aquatic Protection		Human Health	
Toxic Parameter and Form		Carcinogen?		Acute	Chronic	Supplies	Other Surface Waters	Acute	Chronic		
Ammonia-N (Annual)		N		9.2E+00 mg/L	1.3E+00 mg/L	None	None	2.9E+01 mg/L	5.8E+00 mg/L	N/A	
Ammonia-N (Wet Season)		N		7.3E+00 mg/L	1.8E+00 mg/L	None	None	3.2E+01 mg/L	9.9E+00 mg/L	N/A	
Chlorine, Total Residual		N		1.9E-02 mg/L	1.1E-02 mg/L	None	None	6.0E-02 mg/L	4.5E-02 mg/L	N/A	
DDD		Y		None	None	3.1E-03	3.1E-03	N/A	N/A		3.2E-02
DDE		Y		None	None	2.2E-03	2.2E-03	N/A	N/A		2.3E-02
Hydrogen Sulfide		N		None	2.0E+00	None	None	N/A	8.2E+00		N/A
Kepone		N		None	Zero	None	None	N/A	Zero		N/A
Tributyltin		N		4.6E-01	7.2E-02	None	None	1.5E+00	2.9E-01		N/A

PROTOCOL FOR THE EVALUATION OF THE EFFLUENT – TOXIC POLLUTANTS

Toxic pollutants were evaluated in accordance with OWP Guidance Memo No. 00-2011 (8/24/00). Acute and Chronic Waste Load Allocations (WLA_a and WLA_c) were analyzed according to the protocol below using a statistical approach (STAT.exe) to determine the necessity and magnitude of limits. Human Health Waste Load Allocations (WLA_{hh}) were analyzed according to the same protocol through a simple comparison with the effluent data. If the WLA_{hh} exceeded the effluent datum or data mean, no limits were required. If the effluent datum or data mean exceeded the WLA_{hh} , the WLA_{hh} was imposed as the limit.

Since there are no data available for any toxic pollutants immediately upstream of this discharge, all upstream (background) pollutant concentrations are assumed to be "0".

The steps used in evaluating the effluent data are as follows:

- A. If all data are reported as "below detection" or $<$ the required Quantification Level (QL), and at least one detection level is \leq the required QL, then the pollutant is considered to be not significantly present in the discharge and no further monitoring is required.
- B. If all data are reported as "below detection", and all detection levels are $>$ the required QL, then an evaluation is performed in which the pollutant is assumed present at the lowest reported detection level.
 - B.1. If the evaluation indicates that no limits are needed, then the existing data set is adequate and no further monitoring is required.
 - B.2. If the evaluation indicates that limits are needed, then the existing data set is inadequate to make a determination and additional monitoring is required.
- C. If any data value is reported as detectable at or above the required QL, then the data are adequate to determine whether effluent limits are needed.
 - C.1. If the evaluation indicates that no limits are needed, then no further monitoring is required.
 - C.2. If the evaluation indicates that limits are needed, then the limits and associated requirements are specified in the draft permit.
 - C.3. (Exception for Metals data only) If the evaluation indicates that limits are needed, but the data are reported as a form other than "Dissolved", then the existing data set is inadequate to make a determination and additional monitoring is required.

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Parameter	CASRN	Type	QL (µg/L)	Data (µg/L unless noted otherwise)	Source of Data	Data Eval
Acenaphthene	83-32-9	B	10	Previously evaluated. No further monitoring required.	---	---
Acrolein	107-02-8	V	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Acrylonitrile ^c	107-13-1	V	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Aldrin ^c	309-00-2	P	0.05	Previously evaluated. No further monitoring required.	---	---
Ammonia-N (mg/L)	766-41-7	X	0.2 mg/L	Default = 9 mg/L	b	C.2
Anthracene	120-12-7	B	10	Previously evaluated. No further monitoring required.	---	---
Antimony, dissolved	7440-36-0	M	0.2	Previously evaluated. No further monitoring required.	---	---
Arsenic, dissolved	7440-38-2	M	1.0	Applicable to PWS waters only.	---	---
Barium, dissolved	7440-39-3	M	---	Applicable to PWS waters only	---	---
Benzene ^c	71-43-2	V	10	Previously evaluated. No further monitoring required.	---	---
Benzidine ^c	92-87-5	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Benzo (a) anthracene ^c	56-55-3	B	10	Previously evaluated. No further monitoring required.	---	---
Benzo (b) fluoranthene ^c	205-99-2	B	10	Previously evaluated. No further monitoring required.	---	---
Benzo (k) fluoranthene ^c	207-08-9	B	10	Previously evaluated. No further monitoring required.	---	---
Benzo (a) pyrene ^c	50-32-8	B	10	Previously evaluated. No further monitoring required.	---	---
Bis2-Chloroethyl Ether	111-44-4	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Bis2-Chloroisopropyl Ether	39638-32-9	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Bromoform ^c	75-25-2	V	10	Previously evaluated. No further monitoring required.	---	---
Butylbenzylphthalate	85-68-7	B	10	Previously evaluated. No further monitoring required.	---	---
Cadmium, dissolved	7440-43-9	M	0.3	Previously evaluated. No further monitoring required.	---	---
Carbon Tetrachloride ^c	56-23-5	V	10	Previously evaluated. No further monitoring required.	---	---
Chlordane ^c	57-74-9	P	0.2	Previously evaluated. No further monitoring required.	---	---
Chloride (mg/L)	16887-00-6	X	---	Previously evaluated. No further monitoring required.	---	---
TRC (mg/L)	7782-50-5	X	0.1 mg/L	Default = 20 mg/L	b	C.2
Chlorobenzene	108-90-7	V	50	Previously evaluated. No further monitoring required.	---	---
Chlorodibromomethane ^c	124-48-1	V	10	Previously evaluated. No further monitoring required.	---	---
Chloroform ^c	67-66-3	V	10	Previously evaluated. No further monitoring required.	---	---
2-Chloronaphthalene	91-58-7	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
2-Chlorophenol	95-57-8	A	10	Previously evaluated. No further monitoring required.	---	---
Chlorpyrifos	2921-88-2	P	---	Previously evaluated. No further monitoring required.	---	---
Chromium III, dissolved	16065-83-1	M	0.5	Previously evaluated. No further monitoring required.	---	---
Chromium VI, dissolved	18540-29-9	M	0.5	Previously evaluated. No further monitoring required.	---	---
Chromium, Total	7440-47-3	M	---	Applicable to PWS waters only	---	---
Chrysene ^c	218-01-9	B	10	Previously evaluated. No further monitoring required.	---	---
Copper, dissolved	7440-50-8	M	0.5	Previously evaluated. No further monitoring required.	---	---
Cyanide, Free	57-12-5	X	10	Previously evaluated. No further monitoring required.	---	---
DDD ^c	72-54-8	P	0.1	<0.05	a	A
DDE ^c	72-55-9	P	0.1	<0.05	a	A
DDT ^c	50-29-3	P	0.1	Previously evaluated. No further monitoring required.	---	---
Demeton	8065-48-3	P	---	Previously evaluated. No further monitoring required.	---	---
Dibenz(a,h)anthracene ^c	53-70-3	B	20	Previously evaluated. No further monitoring required.	---	---
1,2-Dichlorobenzene	95-50-1	B	10	Previously evaluated. No further monitoring required.	---	---

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Parameter	CASRN	Type	QL (µg/L)	Data (µg/L unless noted otherwise)	Source of Data	Data Eval
1,3-Dichlorobenzene	541-73-1	B	10	Previously evaluated. No further monitoring required.	---	---
1,4-Dichlorobenzene	106-46-7	B	10	Previously evaluated. No further monitoring required.	---	---
3,3-Dichlorobenzidine ^C	91-94-1	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Dichlorobromomethane ^C	75-27-4	V	10	Previously evaluated. No further monitoring required.	---	---
1,2-Dichloroethane ^C	107-06-2	V	10	Previously evaluated. No further monitoring required.	---	---
1,1-Dichloroethylene	75-35-4	V	10	Previously evaluated. No further monitoring required.	---	---
1,2-trans-dichloroethylene	156-60-5	V	---	NEW REQUIREMENT. Needs to be sampled.	---	---
2,4-Dichlorophenol	120-83-2	A	10	Previously evaluated. No further monitoring required.	---	---
2,4-Dichlorophenoxy acetic acid (syn. = 2,4-D)	94-75-7	P	---	Applicable to PWS waters only	---	---
1,3-Dichloropropene	542-75-6	V	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Dieldrin ^C	60-57-1	P	---	Previously evaluated. No further monitoring required.	---	---
Diethyl Phthalate	84-66-2	B	10	NEW REQUIREMENT. Needs to be sampled.	---	---
Di-2-Ethylhexyl Phthalate ^C	117-81-7	B	10	Previously evaluated. No further monitoring required.	---	---
2,4-Dimethylphenol	105-67-9	A	10	Previously evaluated. No further monitoring required.	---	---
Dimethyl Phthalate	131-11-3	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Di-n-Butyl Phthalate	84-74-2	B	10.0	Previously evaluated. No further monitoring required.	---	---
2,4 Dinitrophenol	51-28-5	A	---	NEW REQUIREMENT. Needs to be sampled.	---	---
2-Methyl-4,6-Dinitrophenol	534-52-1	A	---	NEW REQUIREMENT. Needs to be sampled.	---	---
2,4-Dinitrotoluene ^C	121-14-2	B	10	Previously evaluated. No further monitoring required.	---	---
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq)	1746-01-6	X	0.00001	Applicable to Paper Mills & Oil Refineries only	---	---
1,2-Diphenylhydrazine ^C	122-66-7	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Alpha-Endosulfan (syn = Alpha-Endosulfan I)	959-98-8	P	---	Previously evaluated. No further monitoring required.	---	---
Beta-Endosulfan (syn = Alpha- Endosulfan II)	33213-65-9	P	---	Previously evaluated. No further monitoring required.	---	---
Endosulfan Sulfate	1031-07-8	P	---	Previously evaluated. No further monitoring required.	---	---
Endrin	72-20-8	P	0.1	Previously evaluated. No further monitoring required.	---	---
Endrin Aldehyde	7421-93-4	P	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Ethylbenzene	100-41-4	V	10	Previously evaluated. No further monitoring required.	---	---
Fluoranthene	206-44-0	B	10	Previously evaluated. No further monitoring required.	---	---
Fluorene	86-73-7	B	10	Previously evaluated. No further monitoring required.	---	---
Foaming Agents		X	---	Applicable to PWS waters only	---	---
Guthion	86-50-0	P	---	Previously evaluated. No further monitoring required.	---	---
Heptachlor ^C	76-44-8	P	0.05	Previously evaluated. No further monitoring required.	---	---
Heptachlor Epoxide ^C	1024-57-3	P	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Hexachlorobenzene ^C	118-74-1	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Hexachlorobutadiene ^C	87-68-3	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Hexachlorocyclohexane Alpha-BHC ^C	319-84-6	P	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Hexachlorocyclohexane Beta-BHC ^C	319-85-7	P	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Hexachlorocyclohexane Gamma-BHC ^C (syn. = Lindane)	58-89-9	P	---	Previously evaluated. No further monitoring required.	---	---
Hexachlorocyclopentadiene	77-47-4	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---

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Parameter	CASRN	Type	QL (µg/L)	Data (µg/L unless noted otherwise)	Source of Data	Data Eval
Hexachloroethane ^C	67-72-1	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Hydrogen Sulfide	7783-06-4	X	---	<42	a	A
Indeno (1,2,3-cd) pyrene ^C	193-39-5	B	20	Previously evaluated. No further monitoring required.	---	---
Iron, dissolved	7439-89-6	M	1.0	Applicable to PWS waters only	---	---
Isophorone ^C	78-59-1	B	10	Previously evaluated. No further monitoring required.	---	---
Kepone	143-50-0	P	---	<0.05	a	A
Lead, dissolved	7439-92-1	M	0.5	Previously evaluated. No further monitoring required.	---	---
Malathion	121-75-5	P	---	Previously evaluated. No further monitoring required.	---	---
Manganese	7439-96-5	M	0.2	Applicable to PWS waters only	---	---
Mercury, dissolved	7439-97-6	M	1.0	Previously evaluated. No further monitoring required.	---	---
Methyl Bromide	74-83-9	V	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Methylene Chloride ^C	75-09-2	V	20.0	NEW REQUIREMENT. Needs to be sampled.	---	---
Methoxychlor	72-43-5	P	---	Previously evaluated. No further monitoring required.	---	---
Mirex	2385-85-5	P	---	Previously evaluated. No further monitoring required.	---	---
Nickel, dissolved	7440-02-0	M	0.5	Previously evaluated. No further monitoring required.	---	---
Nitrate (as N)	14797-55-8	X	---	Applicable to PWS waters only	---	---
Nitrobenzene	98-95-3	B	10	Previously evaluated. No further monitoring required.	---	---
N-Nitrosodimethylamine ^C	62-75-9	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
N-Nitrosodiphenylamine ^C	86-30-6	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
N-Nitrosodi-n-propylamine ^C	621-64-7	B	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Parathion	56-38-2	P	---	Previously evaluated. No further monitoring required.	---	---
PCB Total ^C	1336-36-3	p	---	Previously evaluated. No further monitoring required.	---	---
Pentachlorophenol ^C	87-86-5	A	50	Previously evaluated. No further monitoring required.	---	---
Phenol	108-95-2	A	10	Previously evaluated. No further monitoring required.	---	---
Pyrene	129-00-0	B	10	Previously evaluated. No further monitoring required.	---	---
Beta Particle & Photon Activity (mrem/yr)		R	---	Applicable to PWS waters only	---	---
Combined Radium 226 and 228 (pCi/L)		R	---	Applicable to PWS waters only	---	---
Gross Alpha Particle Activity (pCi/L)		R	---	Applicable to PWS waters only	---	---
Uranium		R		Applicable to PWS waters only	---	---
Selenium, total recoverable	7782-49-2	M	2.0	Previously evaluated. No further monitoring required.	---	---
Silver, dissolved	7440-22-4	M	0.2	Previously evaluated. No further monitoring required.	---	---
Sulfate	14808-79-8	X	---	Applicable to PWS waters only	---	---
1,1,2,2-Tetrachloroethane ^C	79-34-5	V	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Tetrachloroethylene ^C	127-18-4	V	10	Previously evaluated. No further monitoring required.	---	---
Toluene	10-88-3	V	10	Previously evaluated. No further monitoring required.	---	---
Total dissolved solids		X	---	Applicable to PWS waters only	---	---
Toxaphene ^C	8001-35-2	P	5.0	Previously evaluated. No further monitoring required.	---	---
Tributyltin	60-10-5	P	---	<0.05	a	A
1,2,4-Trichlorobenzene	120-82-1	B	10	Previously evaluated. No further monitoring required.	---	---
1,1,2-Trichloroethane ^C	79-00-5	V	---	NEW REQUIREMENT. Needs to be sampled.	---	---
Trichloroethylene ^C	79-01-6	V	10	Previously evaluated. No further monitoring required.	---	---

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Parameter	CASRN	Type	QL (µg/L)	Data (µg/L unless noted otherwise)	Source of Data	Data Eval
2,4,6-Trichlorophenol ^C	88-06-2	A	10	Previously evaluated. No further monitoring required.	---	---
2-(2,4,5-Trichlorophenoxy) propionic acid (synonym = Silvex)	93-72-1	P	---	Applicable to PWS waters only	---	---
Vinyl Chloride ^C	75-01-4	V	10	Previously evaluated. No further monitoring required.	---	---
Zinc, dissolved	7440-66-6	M	2.0	Previously evaluated. No further monitoring required.	---	---

"Type" column indicates a category assigned to the referenced substance (see below):

A = Acid Extractable Organic Compounds

B = Base/Neutral Extractable Organic Compounds

M = Metals

p = PCBs

P = Pesticides

V = Volatile Organic Compounds

X = Miscellaneous Compounds and Parameters

"Source of Data" codes:

a = Permittee monitoring

b = Agency default values per GM 00-2011

"Data Evaluation" codes:

See section titled "EVALUATION OF EFFLUENT TOXIC POLLUTANTS" (preceding the parameter table) for an explanation of the code used.

The superscript "C" following the parameter name indicates that the substance is a known or suspected carcinogen; human health criteria at risk level 10^{-5} .

CASRN = Chemical Abstract Service Registry Number for each parameter is referenced in the current Water Quality Standards. A unique numeric identifier designating only one substance. The Chemical Abstract Service is a division of the American Chemical Society.

STAT.EXE Results

Ammonia-N (annual)

Chronic averaging period = 30

WLAa = 29

WLAc = 5.8

Q.L. = 0.2

samples/mo. = 30

samples/wk. = 7

Summary of Statistics:

observations = 1

Expected Value = 9

Variance = 29.16

C.V. = 0.6

97th percentile daily values = 21.9007

97th percentile 4 day average = 14.9741

97th percentile 30 day average = 10.8544

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 11.7024865418146

Average Weekly Limit = 7.1467928680048

Average Monthly Limit = 5.8

The data are: 9

Ammonia-N (wet)

Chronic averaging period = 30

WLAa = 32

WLAc = 9.9

Q.L. = 0.2

samples/mo. = 30

samples/wk. = 7

Summary of Statistics:

observations = 1

Expected Value = 9

Variance = 29.16

C.V. = 0.6

97th percentile daily values = 21.9007

97th percentile 4 day average = 14.9741

97th percentile 30 day average = 10.8544

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 19.9749339248215

Average Weekly Limit = 12.198836102284

Average Monthly Limit = 9.9

The data are: 9

TRC

Chronic averaging period = 4

WLAa = 0.06

WLAc = 0.045

Q.L. = 0.1

samples/mo. = 360

samples/wk. = 90

Summary of Statistics:

observations = 1

Expected Value = 20

Variance = 144

C.V. = 0.6

97th percentile daily values = 48.6683

97th percentile 4 day average = 33.2758

97th percentile 30 day average = 24.1210

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity

Maximum Daily Limit = 0.06

Average Weekly Limit = 2.77129017237989E-02

Average Monthly Limit = 2.61233207629799E-02

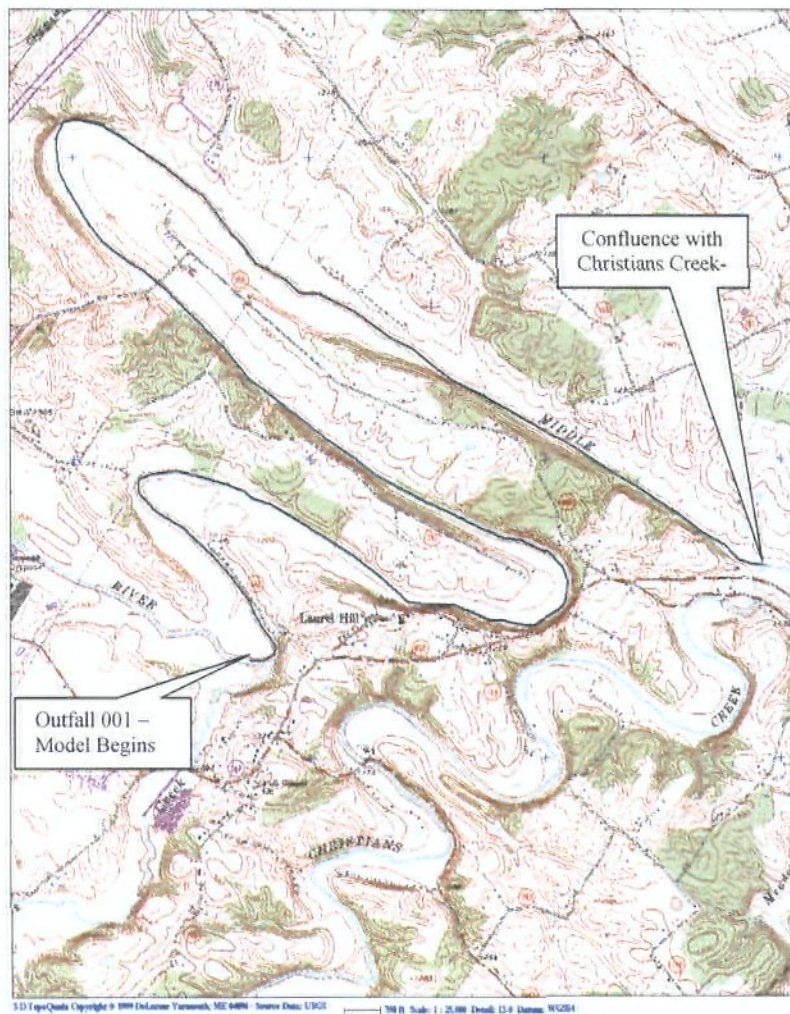
The data are: 20

Regional Stream Modeling Information

Segmentation and General Discussion:

Segment #	Starts at:	Elev. (ft)	Length (mi)	Inputs	Comments
1	Middle River Regional STP	1204	8.9	Design Flow = 6.8 MGD cBOD ₅ = 25 mg/L TKN = 8.7 mg/L DO = 0 mg/L Temp = 24 C	
Model ends	Confluence with Christians Creek	1135			

Map of Modeled Segments:



Fact Sheet – VPDES Permit No. VA0064793 – Middle River Regional STP

Modeling Input Data:

<p>REGIONAL MODELING SYSTEM VERSION 4.11</p> <p>File Information Date Modified: December 2, 2003</p> <p>Water Quality Standards Information Stream Name: MIDDLE RIVER River Basin: Potomac/Shenandoah Rivers Basin Section: 4 Class: IV - Mountainous Zones Waters Special Standards: pH</p> <p>Background Flow Information Gauge Used: FFD dated 9/8/03 Gauge Drainage Area: 200.4 Sq.Mi. Gauge 7Q10 Flow: 20.9MGD Headwater Drainage Area: 200.4 Sq.Mi. Headwater 7Q10 Flow: 20.9 MGD (Net; includes Withdrawals/Discharges) Withdrawal/Discharges: 0 MGD Incremental Flow in Segments: 0.1042914 MGD/Sq.Mi.</p> <p>Background Water Quality Background Temperature: 22.5 Degrees C Background cBOD5: 2 mg/l Background TKN: 0 mg/l Background D.O.: 7.494751 mg/l</p> <p>Model Segmentation Number of Segments: 1 Model Start Elevation: 1204 ft above MSL Model End Elevation: 1135 ft above MSL</p>	<p>Segment Information for Segment 1</p> <p><u>Definition Information</u> Segment Definition: A discharge enters. Discharge Name: MIDDLE RIVER REGIONAL STP VPDES Permit No.: VA0064793</p> <p><u>Discharger Flow Information</u> Flow: 6.8 MGD cBOD5: 25 mg/l TKN: 8.7 mg/l D.O.: 0 mg/l Temperature: 24 Degrees C</p> <p><u>Geographic Information</u> Segment Length: 8.9 miles Upstream Drainage Area: 200.4 Sq.Mi. Downstream Drainage Area: 0 Sq.Mi. Upstream Elevation: 1204 Ft. Downstream Elevation: 1135 Ft.</p> <p><u>Hydraulic Information</u> Segment Width: 53 Ft. Segment Depth: 1.2 Ft. Segment Velocity: 0.68 Ft./Sec. Segment Flow: 27.7 MGD Incremental Flow: 0 MGD (Applied at end of segment.)</p> <p><u>Channel Information</u> Cross Section: Rectangular Character: Moderately Meandering Pool and Riffle: No Bottom Type: Gravel Sludge: None Plants: None Algae: None</p>
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Model Output:

Model Run For E:\Regional Model\Middle River Regional.mod On 12/2/03 1:49:21 PM

Model is for MIDDLE RIVER .

Model starts at the MIDDLE RIVER REGIONAL STP discharge.

Background Data

7Q10	cBOD5	TKN	DO	Temp
(mgd)	(mg/l)	(mg/l)	(mg/l)	deg C
20.9	2	0	7.495	22.5

Discharge/Tributary Input Data for Segment 1

Flow	cBOD5	TKN	DO	Temp
(mgd)	(mg/l)	(mg/l)	(mg/l)	deg C
6.8	25	8.7	0	24

Hydraulic Information for Segment 1

Length	Width	Depth	Velocity
(mi)	(ft)	(ft)	(ft/sec)
8.9	53	1.2	0.68

Initial Mix Values for Segment 1

Flow	DO	cBOD	nBOD	DOSat	Temp
(mgd)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	deg C
27.7	5.655	19.116	6.059	8.285	22.86823

Rate Constants for Segment 1. - (All units Per Day)

k1	k1@T	k2	k2@T	kn	kn@T	BD	BD@T
0.7	0.799	4.652	4.979	0.25	0.312	0	0

Output for Segment 1

Segment starts at MIDDLE RIVER REGIONAL STP

Total	Segm.			
Dist.	Dist.	DO	cBOD	nBOD
(mi)	(mi)	(mg/l)	(mg/l)	(mg/l)
0	0	5.655	19.116	6.059
0.1	0.1	5.62	18.979	6.042
0.2	0.2	5.587	18.843	6.025
0.3	0.3	5.557	18.708	6.008
0.4	0.4	5.529	18.574	5.991
0.5	0.5	5.503	18.441	5.974
0.6	0.6	5.479	18.309	5.957
0.7	0.7	5.457	18.178	5.94
0.8	0.8	5.437	18.048	5.923
0.9	0.9	5.419	17.919	5.906
1	1	5.403	17.791	5.889
1.1	1.1	5.389	17.664	5.873
1.2	1.2	5.376	17.538	5.857
1.3	1.3	5.365	17.413	5.841
1.4	1.4	5.355	17.288	5.825
1.5	1.5	5.346	17.164	5.809
1.6	1.6	5.339	17.041	5.793
1.7	1.7	5.333	16.919	5.777
1.8	1.8	5.328	16.798	5.761
1.9	1.9	5.324	16.678	5.745
2	2	5.321	16.559	5.729

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2.1	2.1	5.319	16.441	5.713
2.2	2.2	5.318	16.323	5.697
2.3	2.3	5.318	16.206	5.681
2.4	2.4	5.319	16.09	5.665
2.5	2.5	5.321	15.975	5.649
2.6	2.6	5.324	15.861	5.633
2.7	2.7	5.327	15.748	5.617
2.8	2.8	5.331	15.635	5.601
2.9	2.9	5.336	15.523	5.585
3	3	5.341	15.412	5.569
3.1	3.1	5.347	15.302	5.553
3.2	3.2	5.353	15.193	5.537
3.3	3.3	5.36	15.084	5.522
3.4	3.4	5.367	14.976	5.507
3.5	3.5	5.375	14.869	5.492
3.6	3.6	5.383	14.763	5.477
3.7	3.7	5.392	14.657	5.462
3.8	3.8	5.401	14.552	5.447
3.9	3.9	5.411	14.448	5.432
4	4	5.421	14.345	5.417
4.1	4.1	5.431	14.242	5.402
4.2	4.2	5.442	14.14	5.387
4.3	4.3	5.453	14.039	5.372
4.4	4.4	5.464	13.939	5.357
4.5	4.5	5.475	13.839	5.342
4.6	4.6	5.487	13.74	5.327
4.7	4.7	5.499	13.642	5.312
4.8	4.8	5.511	13.544	5.297
4.9	4.9	5.523	13.447	5.282
5	5	5.535	13.351	5.267
5.1	5.1	5.548	13.256	5.252
5.2	5.2	5.561	13.161	5.237
5.3	5.3	5.574	13.067	5.222
5.4	5.4	5.587	12.974	5.207
5.5	5.5	5.6	12.881	5.192
5.6	5.6	5.613	12.789	5.177
5.7	5.7	5.626	12.698	5.163
5.8	5.8	5.639	12.607	5.149
5.9	5.9	5.653	12.517	5.135
6	6	5.667	12.427	5.121
6.1	6.1	5.681	12.338	5.107
6.2	6.2	5.695	12.25	5.093
6.3	6.3	5.709	12.162	5.079
6.4	6.4	5.723	12.075	5.065
6.5	6.5	5.737	11.989	5.051
6.6	6.6	5.751	11.903	5.037
6.7	6.7	5.765	11.818	5.023
6.8	6.8	5.779	11.733	5.009
6.9	6.9	5.793	11.649	4.995
7	7	5.807	11.566	4.981
7.1	7.1	5.821	11.483	4.967
7.2	7.2	5.835	11.401	4.953
7.3	7.3	5.849	11.319	4.939
7.4	7.4	5.863	11.238	4.925
7.5	7.5	5.877	11.158	4.911

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7.6	7.6	5.891	11.078	4.897
7.7	7.7	5.905	10.999	4.883
7.8	7.8	5.919	10.92	4.869
7.9	7.9	5.933	10.842	4.855
8	8	5.947	10.764	4.841
8.1	8.1	5.961	10.687	4.827
8.2	8.2	5.975	10.611	4.813
8.3	8.3	5.989	10.535	4.8
8.4	8.4	6.003	10.46	4.787
8.5	8.5	6.017	10.385	4.774
8.6	8.6	6.031	10.311	4.761
8.7	8.7	6.044	10.237	4.748
8.8	8.8	6.057	10.164	4.735
8.9	8.9	6.07	10.091	4.722

END OF FILE

The model was stopped at the confluence with of Christians Creek. The Fishersville Regional STP (VA0025291) model uses the predicted instream concentrations from the Middle River Regional STP model as an “input” at the end of segment 2.

APPENDIX D

RATIONALE FOR WHOLE EFFLUENT TOXICITY (WET) REQUIREMENTS

Applicability of TMP: The applicability criteria for a facility to perform toxicity testing is contained in the Departments Guidance Memo No. 00-2012, Toxics Management Program Implementation Guidance, 08/24/00, Part IV. The criteria support the inclusion of effluent toxicity requirements for this facility because it is a major municipal facility with a design flow greater than 1.0 MGD and it has a pretreatment program (Section IV.2.B.).

Summary of Toxicity Testing: The previous permit required annual chronic toxicity testing using *Ceriodaphnia dubia* and *Pimephales promelas*. Table 1 contains a summary of the toxicity testing results during the term of the permit. These data were evaluated using the procedures outlined in the TMP guidance.

Stat.exe Limit Evaluation: The chronic WLA was generated from the WETLimit10.xls spreadsheet shown in Table 2 by entering the design flow, stream flows, and stream mix percentages. WLAs are used in the Department's Stat.exe program in order to perform a statistical evaluation of the chronic test results expressed as Toxicity Units (TUs).

Chronic Stat.exe Limit Evaluation: The summary of the chronic toxicity testing data are shown in Table 1. The results of the Stat.exe evaluation are shown in Table 4. Based on the evaluation of the chronic toxicity data, a Whole Effluent Toxicity (WET) Limit is not required at this time.

Acute Stat.exe Limit Evaluation: Acute testing was not required, so no data are available for evaluation. However, in all chronic tests the 48-hour LC₅₀ for both species were >100%. Since chronic test data can be assessed to some degree for the presence of acute toxicity, the permit can be modified, if necessary, to include acute monitoring or an acute WET limit.

Midpoint Check Stat.exe Evaluation: The midpoint of the chronic dilution series is TUC = 2.44. The midpoint of the chronic test dilution series was evaluated using Stat.exe to determine if limits would be inappropriately triggered (Table 4). The midpoint was entered as a chronic Toxicity Unit (TUC). Since no limit was triggered by the midpoint, the recommended dilution series can be used without the need for adjustment. The midpoint of 41% is considered the chronic endpoint and is equivalent to a TUC of 2.44.

Chronic Dilution Series: The recommended dilution series is shown below:

Design Flow (MGD)	Recommended Chronic Dilution Series, %
6.8	100, 64, 41*, 27, 17

*The midpoint of the dilution series is 41%. The midpoint of the dilution series is derived from the highest anticipated mean of the data (expressed as TUC) that will not trigger a limit in the Department's Stat.exe program. In this case, the 41% is equivalent to a TUC of 2.44.

A most-sensitive species will not be selected, and both species (*Ceriodaphnia dubia* and *Pimephales promelas*) are to be used for the chronic testing. The frequency of testing will continue to be annual, and the sampling period will continue to be September to November.

Table 1

Summary of Chronic Toxicity Testing (NOEC)

Monitoring Period	Test Start Date	Chronic 3-Brood Static Renewal Survival and Reproduction <i>Ceriodaphnia dubia</i> (TUc)			Chronic 7-Day Static Renewal Survival and Growth <i>Pimephales promelas</i> (TUc)		
		Survival (TUc)	Reproduction (TUc)	48 Hr LC ₅₀ (TUc)	Survival (TUc)	Growth (TUc)	48 Hr LC ₅₀ (TUc)
1st Annual	10/31/06	1.0	1.0	<1.0	1.0	1.0	<1.0
2 nd Annual	10/16/07	1.0	2.43	<1.0	1.0	1.0	<1.0
3 rd Annual	11/04/08	1.0	1.0	<1.0	1.56	1.56	<1.0
4 th Annual	10/27/09	1.0	1.0	<1.0	1.0	1.56	<1.0

Table 2

WETLim10.xls Spreadsheet

Spreadsheet for determination of WET test endpoints or WET limits

Excel 97
Revision Date: 01/10/05
File: WETLim10.xls
(MIX.EXE required also)

Acute Endpoint/Permit Limit		Use as LC ₅₀ in Special Condition, as TUa on DMR		
ACUTE	100% = NOAEC	LC ₅₀ = NA	% Use as	NA
ACUTE WLAa	0.9475434	Note: Inform the permittee that if the mean of the data exceeds this TUa	1.0	a limit may result using WLA EXE

Chronic Endpoint/Permit Limit		Use as NOEC in Special Condition, as TUc on DMR		
CHRONIC	5.97934944 TU _c	NOEC =	17 % Use as	5.88 TU _c
BOTH*	9.47543406 TU _c	NOEC =	11 % Use as	9.09 TU _c
AML	5.97934944 TU _c	NOEC =	17 % Use as	5.88 TU _c
ACUTE WLAa,c	9.4754338	Note: Inform the permittee that if the mean of the data exceeds this TUc	2.4571818	a limit may result using WLA EXE
CHRONIC WLAc	4.0882353			

*Both means acute expressed as chronic

Enter data in the cells with blue type:

Entry Date: 10/07/10
Facility Name: Middle River Regional STP
VPDES Number: VA0064793
Outfall Number: 001

% Flow to be used from MIX.EXE		Diffuser /modeling study?	
Plant Flow	6.8 MGD	Enter Y/N	N
Acute 1Q10	19.5 MGD	Acute	1:1
Chronic 7Q10	21 MGD	Chronic	1:1

Are data available to calculate CV? (Y/N) N (Minimum of 10 data points, same species, needed)
Are data available to calculate ACR? (Y/N) N (NOEC<LC50, do not use greater/less than data) Go to Page 2
Go to Page 3

IWC _a	31.6608195 %	Plant flow/plant flow + 1Q10	NOTE: If the IWCa is >33%, specify the NOAEC = 100% test/endpoint for use
IWC _c	24.46043165 %	Plant flow/plant flow + 7Q10	
Dilution, acute	3.158477941	100/IWC _a	
Dilution, chronic	4.088235294	100/IWC _c	
WLA _a	0.947543382	Instream criterion (0.3 TUa) X's Dilution, acute	
WLA _c	4.088235294	Instream criterion (1.0 TUc) X's Dilution, chronic	
WLA _{a,c}	9.475433824	ACR X's WLA _a - converts acute WLA to chronic units	
ACR -acute/chronic ratio	10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)	
CV-Coefficient of variation	0.6	Default of 0.6 - if data are available, use tables Page 2)	
Constants	eA 0.4109447 Default = 0.41		
	eB 0.6010373 Default = 0.60		
	eC 2.4334175 Default = 2.43		
	eD 2.4334175 Default = 2.43 (1 samp) No. of sample		
LTA _a	3.89387931	WLAa,c X's eA	
LTA _c	2.457181903	WLAc X's eB	
MDL** with LTA _{a,c}	9.475434056 TU _c	NOEC = 10.553606 (Protects from acute/chronic toxicity)	Rounded NOEC's %
MDL** with LTA _c	5.979349443 TU _c	NOEC = 16.724227 (Protects from chronic toxicity)	NOEC = 11 %
AML with lowest LTA	5.979349443 TU _c	NOEC = 16.724227 Lowest LTA X's eD	NOEC = 17 %

**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTAa,c and MDL using it are driven by the ACR.

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU _c to TU _a			
MDL with LTA _{a,c}	0.947543406 TU _a	LC50 = 105.536062 %	Use NOAEC=100%
MDL with LTA _c	0.597934944 TU _a	LC50 = 167.242274 %	Use NOAEC=100%

Rounded LC50's %
LC50 = NA %
LC50 = NA %

Table 3

Dilution Series Recommended for Chronic Toxicity Monitoring

<u>ADJUSTED DILUTION SERIES TO RECOMMEND</u>				
	Monitoring % Effluent	TUc	Limit % Effluent	TUc
Dilution series based on data mean	41	2.457182		
Dilution series to use for limit			17	5.88
Dilution factor to recommend:	0.640312424		0.412310563	
Dilution series to recommend:	100.0	1.00	100.0	1.00
	64.0	1.56	41.2	2.43
	41.0	2.44	17.0	5.88
	26.3	3.81	7.0	14.27
	16.8	5.95	2.9	34.60
Extra dilutions if needed	10.76	9.29	1.19	83.92
	6.89	14.51	0.49	203.54

Table 4

Stat.exe Results

Chemical = WET - Chronic, C.dubia Chronic averaging period = 4 WLAa,c = 9.4754338 WLAc = 4.0882353 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 4 Expected Value = 1.3575 Variance = .663410 C.V. = 0.6 97th percentile daily values = 3.30336 97th percentile 4 day average = 2.25859 97th percentile 30 day average = 1.63721 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data No Limit is required for this material The data are: 1, 2.43, 1, 1	Chemical = WET - Chronic, P.promelas Chronic averaging period = 4 WLAa,c = 9.4754338 WLAc = 4.0882353 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 4 Expected Value = 1.28 Variance = .589824 C.V. = 0.6 97th percentile daily values = 3.11477 97th percentile 4 day average = 2.12965 97th percentile 30 day average = 1.54374 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data No Limit is required for this material The data are: 1, 1, 1.56, 1.56	Chemical = WET - Chronic, Midpoint Check Chronic averaging period = 4 WLAa,c = 9.4754338 WLAc = 4.0882353 Q.L. = 1 # samples/mo. = 1 # samples/wk. = 1 Summary of Statistics: # observations = 1 Expected Value = 2.44 Variance = 2.14329 C.V. = 0.6 97th percentile daily values = 5.93753 97th percentile 4 day average = 4.05964 97th percentile 30 day average = 2.94276 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data No Limit is required for this material The data are: 2.44
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APPENDIX E

PERMIT CHANGES AND BASES FOR SPECIAL CONDITIONS

Tabulated below are the sections of the permit, with any changes and the reasons for the changes identified. Also provided is the basis for each of the permit special conditions.

Cover Page	<ul style="list-style-type: none">• Content and format as prescribed by the VPDES Permit Manual.• The city reference was removed.
Part I.A.1.	<p>Effluent Limitations and Monitoring Requirements: Bases for effluent limits provided in previous pages of this fact sheet. Monitoring requirements as prescribed by the VPDES Permit Manual.</p> <p><i>Updates Part I.A.1. of the previous permit with the following:</i></p> <ul style="list-style-type: none">• Less stringent Ammonia-N (Jun-Oct) limits were included.• Less stringent Ammonia-N (Nov-May) limits were included.• Nutrient monitoring and limits that are duplicative of what is required by the Nutrient GP were removed.• E. coli footnote was removed.• Footnote added that Total Nitrogen and Total Phosphorus load limits are included in the current Registration List for the General VPDES Watershed Permit Regulation.
Part I.B.	<p>TRC Effluent Limitations and Monitoring Requirements: <i>Updates Part I.B. of the previous permit.</i> Specifies both disinfection and effluent limits and monitoring requirements should the permittee elect to switch from alternate disinfection to chlorine disinfection. Required by Sewage Collection and Treatment (SCAT) Regulations and 9 VAC 25-260-170, Bacteria; other waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection.</p>
Part I.C.	<p>Effluent Limitations and Monitoring Requirements – Additional Instructions: <i>Updates Part I.C. of the previous permit.</i> Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.</p>
Part I.D.	<p>Pretreatment Program Requirements: <i>Updates Part I.D. of the previous permit.</i> VPDES Permit Regulation, 9 VAC 25-31-730 through 900, and 40 CFR part 403 require certain existing and new sources of pollution to meet specified regulations.</p>
Part I.E.	<p>Toxics Management Program Requirements: <i>Updates Part I.E. of the previous permit.</i> VPDES Permit Regulation, 9 VAC 25-31-210 and 220 I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act.</p>
Part I.F.1.	<p>95% Capacity Reopener: <i>Identical to Part I.F.1. of the previous permit.</i> Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 4 for certain permits.</p>
Part I.F.2.	<p>Indirect Dischargers: <i>Identical to Part I.F.2. of the previous permit.</i> Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 1 for all STPs that receive waste from someone other than the owner of the treatment works.</p>

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- Part I.F.3. **Materials Handling/Storage:** *Identical to Part I.F.3.9 VAC 25-31-280.B.2.* requires that the types and quantities of “wastes, fluids, or pollutants which are ... treated, stored, etc.” be addressed for all permitted facilities.
- Part I.F.4. **O&M Manual Requirement:** *Updates Part I.F.4. of the previous permit.* Required by Code of Virginia 62.1-44.19, SCAT Regulations 9 VAC 25-790, and VPDES Permit Regulation 9 VAC 25-31-190 E for all STPs. Added requirement to describe procedures for documenting compliance with the permit requirement that there shall be no discharge of floating solids or visible foam in other than trace amounts.
- Part I.F.5. **CTC/CTO Requirement:** *Updates Part I.F.12. of the previous permit.* Required by Code of Virginia 62.1-44.19, SCAT Regulations 9 VAC 25-790, and VPDES Permit Regulation 9 VAC 25-31-190 E for all STPs.
- Part I.F.6. **SMP Requirement:** *Updates Part H. of the previous permit.* VPDES Permit Regulation 9 VAC 25-31-100 P, 220 B 2, and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. Technical requirements are derived from the Virginia Pollution Abatement Permit Regulation (9 VAC 25-32-10 *et seq.*)
- Part I.F.7. **Licensed Operator Requirement:** *Updates Part I.F.5. of the previous permit.* The VPDES Permit Regulation 9 VAC 25-31-200 C, the Code of Virginia 54.1-2300 *et seq.*, and Rules and Regulations for Waterworks and Wastewater Works Operators 18 VAC 160-20-10 *et seq.*, require licensure of operators. A class I license is now required for the this facility instead of a class II license.
- Part I.F.8. **Reliability Class:** *Identical to Part I.F.6. of the previous permit.* Required by SCAT Regulations 9 VAC 25-790.
- Part I.F.9. **Water Quality Criteria Monitoring:** *Updates Part I.F.7. of the previous permit.* State Water Control Law at 62.1-44.21 authorizes the Board to request information needed to determine the discharge’s impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, subpart 131.11. To ensure that water quality criteria are maintained, the permittee is required to analyze the facility’s effluent for the substances noted in Attachment A of this VPDES permit.
- Part I.F.10. **Treatment Works Closure Plan:** *Updates Part I.F.8. of the previous permit.* Required for all STPs per the State Water Control Law at 62.1-44.18.C. and 62.1-44.15:1.1., and the SCAT Regulations at 9 VAC 25-790-450.E. and 9 VAC 25-790-120.E.3.
- Part I.F.11. **Reopeners:**
New Requirement: a. Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.
New Requirement: b. 9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.
Updates Part I.F.9. c. 9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.
New Requirement: d. Required by the VPDES Permit Regulation, 9 VAC 25-31-220.C, for all permits issued to STPs.

Fact Sheet – VPDES Permit No. VA0064793 – Middle River Regional STP

- Part I.F.12. **Suspension of concentration limits for E3/E4 facilities:** *New Requirement.* 9 VAC 25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.
- Part II CONDITIONS APPLICABLE TO ALL VPDES PERMITS. VPDES Permit Regulation 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

DELETIONS

Tabulated below are the sections of the previous permit that were deleted and the basis for this action.

Part I.A.2. (Sludge Monitoring Requirements) and Part I.H. (Sludge Reporting Requirements) were deleted at this reissuance because the information is duplicative of what is required to be monitored and reported under VPA Permit Nos. VPA01566, VPA01580, and VPA01581.

Part I.F.10., Part I.F.11, and Part I.F. 13 were deleted at this reissuance because the facility has obtained coverage under the Nutrient General Permit.

Part I.G. Schedule of Compliance to meet nutrient limits has been removed from this permit.

**State "Transmittal Checklist" to Assist in Targeting
Municipal and Industrial Individual NPDES Draft Permits for Review**

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name: Middle River Regional STP

NPDES Permit Number: VA0064793

Permit Writer Name: Kate B. Harrigan

Date: 12/30/10

Major [X]

Minor []

Industrial []

Municipal [X]

I.A. Draft Permit Package Submittal Includes:

	Yes	No	N/A
1. Permit Application?	x		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	x		
3. Copy of Public Notice?		X	
4. Complete Fact Sheet?	x		
5. A Priority Pollutant Screening to determine parameters of concern?	x		
6. A Reasonable Potential analysis showing calculated WQBELs?	x		
7. Dissolved Oxygen calculations?	x		
8. Whole Effluent Toxicity Test summary and analysis?	x		
9. Permit Rating Sheet for new or modified industrial facilities?			X

I.B. Permit/Facility Characteristics

	Yes	No	N/A
1. Is this a new, or currently unpermitted facility?		x	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	x		
3. Does the fact sheet or permit contain a description of the wastewater treatment process?	x		

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		x	
5. Has there been any change in streamflow characteristics since the last permit was developed?	x		
6. Does the permit allow the discharge of new or increased loadings of any pollutants?	x		
7. Does the fact sheet or permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	x		
8. Does the facility discharge to a 303(d) listed water?	x		
a. Has a TMDL been developed and approved by EPA for the impaired water?	x		
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?			x
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	x		
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?	x		
10. Does the permit authorize discharges of storm water?		x	
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?	x		
12. Are there any production-based, technology-based effluent limits in the permit?	x		
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		x	
14. Are any WQBELs based on an interpretation of narrative criteria?		x	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		x	
16. Does the permit contain a compliance schedule for any limit or condition?		x	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		x	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	x		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		x	
20. Have previous permit, application, and fact sheet been examined?	x		

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Checklist – for POTWs (To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration

	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	x		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	x		

II.B. Effluent Limits – General Elements

	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	x		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	x		

II.C. Technology-Based Effluent Limits (POTWs)

	Yes	No	N/A
1. Does the permit contain numeric limits for <u>ALL</u> of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	x		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	x		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	x		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	x		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		x	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			x

II.D. Water Quality-Based Effluent Limits

	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	x		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?	x		

II.D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
3. Does the fact sheet provide effluent characteristics for each outfall?	x		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	x		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	x		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	x		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	x		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?	x		
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	x		
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	x		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	x		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	x		
8. Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	x		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	x		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	x		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		x	
4. Does the permit require testing for Whole Effluent Toxicity?	x		

II.F. Special Conditions	Yes	No	N/A
1. Does the permit include appropriate biosolids use/disposal requirements?	x		
2. Does the permit include appropriate storm water program requirements?			x

II.F. Special Conditions – cont.

	Yes	No	N/A
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			x
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?			x
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?			x
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?			x
a. Does the permit require implementation of the "Nine Minimum Controls"?			x
b. Does the permit require development and implementation of a "Long Term Control Plan"?			x
c. Does the permit require monitoring and reporting for CSO events?			x
7. Does the permit include appropriate Pretreatment Program requirements?	x		

II.G. Standard Conditions

	Yes	No	N/A
1. Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	x		
List of Standard Conditions – 40 CFR 122.41			
Duty to comply Duty to reapply Need to halt or reduce activity not a defense Duty to mitigate Proper O & M Permit actions	Property rights Duty to provide information Inspections and entry Monitoring and records Signatory requirement Bypass Upset	Reporting Requirements Planned change Anticipated noncompliance Transfers Monitoring reports Compliance schedules 24-Hour reporting Other non-compliance	
2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?	x		

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	<u>Kate B. Herrigan</u>
Title	<u>Environmental Spec. II</u>
Signature	<u>Kate B. Herrigan</u>
Date	<u>12-30-10</u>